

Marbled Murrelet Population Team Meeting  
April 22, 1999

Jim Baldwin  
Steve Beissenger  
Naomi Bentivoglio

Sherri Miller  
Marty Raphael  
Tim Max

*Team Progress To Date*

Where are we now? Where do we want to be in 12 months? Peer Review?

Some team members felt we could have the elements of a sampling design in place by May, 1999, and have something for peer review by mid June. Others felt it would take a few months longer. Some reviewers mentioned were: Jeff Laake, Ken Burnham, Dave Anderson, Tim Gerrodette in La Jolla, Jay Barlow, Craig Strong, Harry Carter, PSG, Monitoring group (Barry Noon, Barry Mulder, et al.). Linda Long has worked with GTR, also talk to Barry Mulder.

*Sampling Design*

Jim Baldwin sent his write-up to the group via email prior to the meeting (Characterizing the “goodness” of a variety of sampling schemes). Also, he met with Alan Hubbard and Lara Rachowicz at UC Berkeley to better understand Steve Beissinger’s simulation modeling work and assumptions. In short, unless we factor in along shore variability, everything becomes one-dimensional and we can more easily use a close form (formula) than do simulation modeling. If you have the means and standard deviations for the year, can do the estimates without running the simulations. When Jim ran simulated transects with Lara’s means, he got 2 to 1 greater CVs with a single random parallel transect compared with a perpendicular transect. If you consider along shore variation, angular transects would probably do better than perpendicular transects. For along shore, the distribution could be spiky or smooth, smooth with a small clumps, smooth with huge clumps. Steve and Chris have GPS for each bird. Any suggestions for an analysis? Steve put up two years worth of data 1996 and 1997. What should we bring to bear? Note the team threw out the perpendicular and sawtooth configurations two meetings ago. We may have done that prematurely.

Jim’s assumptions for his analyses: Density function offshore, no along shore variance, and a Poisson distribution. Wants to make it explicit that we’re using the strip transect method to RANK these transect types. Does this matter? May matter to some extent because of variance. Jim uses mean density function. Steve uses ?? function. Jim thinks the two functions have a similar effect. Jim will send Alan Hubbard some additional info. Bottom line is with means and variances, you can skip the simulation runs and probably get the same answers if no along shore variance is considered.

Can we assume offshore is independent from along shore variability? Would we also need to look at daily variation? Its hard to treat something that is truly varying over two dimensions as though it varies in each dimension separately. What about the areas where we have the extensive plus the intensive counts? Suggestion that we pool our data and come together to see if our data

meets. Good idea, start with the questions. (Still some concern the data gathered to date may be insufficient).

SB - Simulation Modeling Results (see handout Evaluating the Statistical Power of Sampling Designs for Apportioning Transects At Sea to Monitor Marbled Murrelets)

Had a bit of trouble turning the offshore intensive samples into smooth curves. Used spline technique. Resulted in 4 Clusters. Averages for a year. Alan Hubbard used a MLE to get an estimate for normalized curves. Converted to a density function. Area under the curve is normalized. Like a smoothed histogram. Concern that small numbers at one particular distance will exaggerate numbers at another place under the curve.

These simulations did not assume much along shore variation within the 80 km segment. Next set of simulations will. Within the annual cluster type, there was a daily change in distribution. There's also sampling variation to be considered. SB thinks his method has probably underestimated variation therefore overestimated power. They did not do stratified estimations, weighting by the amount of area for each strata (the strata offshore is slightly larger). Average number of birds per year. Combined pooled estimated. Total birds per 80 kms. Viewed it as one 80-km transect broken up different ways. % birds detected 3000-5000 m offshore ranged from 0-15% of birds spread out over the whole area. Suggestion for SB: Might want to do a fixed cluster (don't vary the clusters) and then run all the simulations to see what the "non change" means and CVs look like. Look at the clusters independently, or just look at your "virtual" distribution. Does it really approximate the cluster its supposed to? Also, suggest you calculate a stratified estimator of density.

Question: Why doesn't increasing from 5 to 10 days for the third graph change the power for the single 550m transect but it does change the power for the 10 8-km segments? Steve will double check some of the curves.

Sherri

Tami Matsumoto is looking at their offshore distribution data relating to power issues. She'll try to get a package out by next week (week of April 26).

What about the Along Shore Table from the last two meetings? First we need to tackle the sample design, then determine the area to which we are applying it, then determine the pros and cons.

### *Temporal*

Sherri and Carolyn are doing another analysis of some data for the landscape analysis. They recalculated offshore distributions and looked at different discrete time sections. April - July seemed most consistent. Counts in September seemed to shift. By the second week of August activity in forests died down. Which seemed to coincide with shifts in September. Slightly higher counts in July then June.

Marty - handed out a table showing 10 day intervals. June and July tend to be similar. Then in August goes way up and stays up into Sep. The table also illustrates that pooling the segments

reduces the CV in the Distance Sampling program.

Some discussion of the potential for sampling fewer months to reduce variability in counts. Might not hold true if you don't capture the most stable temporal period.

SB - sees drop in August.

MR - Has a temporal data set. Can send out or have ready for next meeting. Can look at discrete time.

Sherri - Also has a data set they're working on. Can also look at discrete times and has more spatial aspects. Suggestion to look at day by day.

NB will talk to Chris about his temporal data.

Treat each day and time as a separate component then conduct a multiway anova? Overall average. Where's the variation coming from? Use a general log linear model? To partition the variation, what do you calculate? Log linear better for presence absence. TM suggests for now run it through a simple model 2 anova to see if anything emerges as an obvious source of variation. Task is to identify sources of concern. If individual observer error is the problem, there may be a way (covariate) to plug in the individual. Note some literature sources team members will disseminate. Fred Ramsey Journal of Wildlife Management, Jay Barlow Harbor porpoises - testing of observers, JB paper using IO to correct for G(0).

MR - see handout on perpendicular/radial distances. Both methods seem equal except when there are lots of birds, and you may miss birds. The birds were missed during the perp. vs radial and 1vs2 observer tests. Whatever method is used, we just need to be able to train people to attain a certain level of accuracy. Suggestions that we need to train daily and test weekly. Must also get at observer variability. We can set targets (ie., someone must be within a certain range).

Do the errors plus or minus a target cancel each other out? TM thinks not. The transfer function is NOT linear. Therefore, they don't cancel each other out.

MR - His crews' mean absolute differences were  $\pm 25\%$  of the actual. Could attempt to get a mean for an individual observer within 25% of the actual perpendicular distance. And report what that mean actually is along with the median. Number of targets? 25 targets per session. Number of times to test? Formally once a week at first. Configuration? Throw out some buoys. Probably a marina setup. Let all know.

### *Independent Observer*

NB - discussed some of CT and Tom Hamer's results with birds missed on the transect lines. FWS considering whether to fund an IO this field season.

MR concerned it extends our zone of detectability since IO looking out ahead of where the standard observers can see. Birds doing different things, diving, flying. That will always be the case. How many factors will we try and correct for? Height of observer platform?

SB sees it differently. We're just trying to fix the intersect line of the density curve.

How far in front of the boat?

Maybe IO could be a good test of the 1 vs 2 observer.

If the IO is intended for correction factor, how do people feel?

JB and TM are skeptical an IO would introduce more variability than they correct for. SB and MR feel they would need more information from Chris Thompson, Tom Hamer and perhaps Jeff Laake to decide.

If we can get the proposed \$ to cover QA instead, how would you feel?

MR and SB said no, because they feel we can get at measurement error from the testing we're doing. TM and JB said yes because the quality assurance/quality control for measurement error is supposed to occur simultaneously with the sampling. QA expects that measurement error (inter-observer error) is relatively small related to sampling error. And QA happens when the measuring is occurring. TM and JB think IOs are good for QA, but not a correction factor. Inter-observer variability should be small versus sampling variance.

#### *To Do List*

All - will send Naomi any reports of survey method tests completed.

Naomi - will disseminate reports of survey method tests completed, and develop comprehensive list of the tests and the remaining issues.

Sherri - will send everyone (or Naomi to disseminate) a report about offshore distribution by the week of April 26.

Marty - will send everyone report/tables/graphs on temporal data set or have ready to discuss May 12.

Naomi - will talk to Chris about his temporal data set.

#### *Next Meeting*

May 12, 1999. Cowlitz Conference Room, Duncan Plaza Bldg., Portland. Time to be determined.